QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Flow of the Lacteal Fluid in the Mesentery.*—JOSEPH LISTER, Esq., read before the British Association a short account of some experiments performed by him in 1853, but now first made public.

"The objects for which they were undertaken were, in the first place, to observe the character of the flow of the chyle through the lacteals: a thing which, so far as I know, had never been satisfactorily done; and, in the second place, to throw some light, if possible, upon the debated question, whether or not the lacteals possess the power of absorbing solid matter, in the form of granules, visible to the human eye. In the experiments made for the former purpose, a mouse having been put under the influence of chloroform, about two hours after partaking of a full meal of bread and milk, the abdominal cavity was laid open by a median longitudinal incision, and the animal having been placed on its side upon a plate of glass, a coil of intestine was drawn out gently, sufficiently far to admit of the microscope being applied to the mesentery, which was kept moistened with water of about 100° Fahrenheit, under a four-tenth object glass. The lacteals were readily recognized as beautiful transparent beaded cords, the beads corresponding to the situations of the valves, which were observed to be standing open while the chyle corpuscles moved along through the tubes with a perfectly equable flow, at a rate about a quarter of that at which the blood passes through the capillaries. There was nothing like rhythmical contraction to be observed in the vessels, and it was evident that the source of the movement of the fluid was some cause in constant and steady operation. Chyle corpuscles, apparently fully formed, to judge from their size, were observed constantly passing along, even in parts very near to the intestine, the scene of absorption, showing the rapidity with which those corpuscles are elaborated. These observations were repeated several times.

"The other set of experiments were conducted in the same manner, except that some insoluble granular material, such as indigo, carmine, or flour of sulphur, was mixed with the food. The animals partook freely of the mixture, which also passed on into the intestines, yet none of the colouring particles were ever to be seen in the lacteals by aid of the microscope, although, had they been present in the granular form in the chyle, they would have been certainly detected, being quite different in appearance from the normal constituents of the fluid. It may be imagined that the substances administered exercised a poisoning influence, and paralyzed the function of absorption. There was, however, no appearance of any such thing, the chyle presenting the same characters both as to its constitution and rate of flow as when simple bread and milk had been alone administered. These facts, though not, perhaps, absolutely conclusive, appear to throw great doubt upon the interpretation which has been given of the alleged cases of absorption of indigo and some other granular substances, and render it probable that the lacteals are incapable of admitting visible solid particles through their parietes."—*Dublin Hospital Gazette*, Nov. 15, 1857.

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2. *On Certain Pathological Characters of the Blood-Corpuscles.*—J. P. HENNESSY, Esq., communicated to the British Association the following results of a series of microscopical observations with regard to healthy and inflamed blood. With regard to healthy blood:—

"1st. That the particles in the lower part of the clot were smaller than those in the upper part, and that, in the bloody serum, the particles which subsided to the bottom of the vessel were smaller than those which floated at the top. In every case, the redness appeared to be in an inverse proportion to the size. 2d. That, after removing the greater part of the fibrin by stirring the blood with a bundle of twigs, the particles which were not disintegrated were larger and paler than usual.

"With regard to inflamed blood, that is, blood drawn from a patient suffering from an inflammatory disease, or blood taken from a part of the body in a state of inflammation, I arrived at the following results:—

"1st. That the particles were smaller and darker than those of healthy blood; the average size of the former being the 4,500th part of an inch. 2d. That, when some of these particles were exposed to the air, and dried, they became larger, attaining, in general, the size of healthy particles, treated in a similar manner. (Mr. Hennessy exemplified this by a verbatim extract from his notes.) 3d. That, where the blood drawn presented the buffy coat, the few particles among the meshes of fibrin in the upper part of the clot were very large, compared with those at the bottom of the clot. 4th. That, on shaking a vessel containing blood from which the clot with buffy coat had been removed, the particles which subsided most rapidly were found to be the smallest and darkest."

The principal fact to be gathered from these results, and to which Mr. H. wishes to direct particular attention, is "that the particles in blood in a state of inflammation are smaller, darker, and of higher specific gravity than those of healthy blood. Regarding this change in the blood-corpuscles as one of the *propria* of inflammation, we are led at once to consider the connection it may have with other phenomena attendant on that state. The questions arise—how far it may account for the appearance of the buffy coat; how far it may go to explain the well known changes of temperature, colour, size, and pain; and whether it may not also furnish some explanation of the action of certain therapeutic agents; in short, how far this molecular change may be employed as the basis for a satisfactory theory of inflammation. The immediate or rather the concomitant physical phenomena attendant on the contraction of the blood particles, are a development of latent heat, an increase of colour, and an increase of specific gravity. Whatever may be the amount of heat developed, however small in each particle the change of colour or increase of specific gravity may be, these are inevitable results of the contraction. On the other hand (and this is a point of great interest, to which I will shortly advert) when the particles are regaining their normal state, an opposite series of phenomena must be presented. Let us apply these results to the physical signs of inflammation. The development of latent heat will explain the rise of temperature. The contraction will effect the colour of an inflamed part, not only by rendering the particles darker, but by permitting them to flow into vessels from which their size had previously excluded them. In becoming smaller, they will necessarily become harder, and be enabled to burst through the walls of the capillaries, which would account for the phenomena of infiltration and pain. The increase in specific gravity, and a diminution in size, are the two causes which conspire to form the buffy coat: the former causing the particles to sink more rapidly, and the latter allowing them to pass through the coagulating meshes of fibrin with less chance of being obstructed."—*Dublin Hosp. Gaz.*, Nov. 15, 1857.